

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus*) from India, presented respectively by Mrs. Woods and Mrs. Sassoon; a Plantain Squirrel (*Sciurus plantani*) from Java, a Vulpine Phalanger (*Trichosurus vulpecula*) from Australia, presented by Mrs. A. Jeffrey; a Ground Hornbill (*Bucorvus abyssinicus*), a Bell's Cinixys (*Cinixys belliana*) from West Africa, presented by Mr. Henry Strachan; a Peregrine Falcon (*Falco peregrinus*), European, presented by Mr. W. R. Bryden; a Brazilian Tapir (*Tapirus americanus*), two Snowy Egrets (*Ardea candidissima*), six Ring-necked Lizards (*Tropidurus torquatus*), three Surinam Lizards (*Ameiva surinamensis*), a Lizard (*Crocodilurus lacertinus*), two Tuberculated Iguanas (*Iguana tuberculata*), six Giant Toads (*Bufo marinus*) from Para, presented by Captain A. Pam; a Vivacious Snake (*Tarbophis fallax*), European, presented by Mr. W. H. St. Quintin; a Spix's Macaw (*Cyanopsittacus spixi*) from Brazil, a Large Grieved Tortoise (*Podocnemis expansa*) from the Amazons, six Florida Tortoises (*Testudo polyphemus*) from North America, four Elegant Snakes (*Tropidonotus ordinatus infernalis*), four Couch's Snakes (*Tropidonotus ordinatus couchi*) from California, deposited; a Bristly Ground Squirrel (*Xerus setosus*) from South Africa, a Pink-headed Duck (*Rhodonessa caryophyllacea*) from India, purchased.

OUR ASTRONOMICAL COLUMN

EPHEMERIS FOR OBSERVATIONS OF EROS:—

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THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Royal Photographic Society hold their annual exhibition this year in the New Gallery, Regent Street, instead of, as heretofore, at the Water Colour Society's Gallery in Pall Mall. The result of the change to the larger galleries is certainly a matter for congratulation, because the very restricted accommodation of previous years crowded out professional and trade work, and gave very little space indeed for the exhibition of scientific and technical photography. This year, if any branch of photography is not represented, it is because of other difficulties than want of space. The only notable omission that occurs to us is that of cinematography, and this is accounted for by the very stringent regulations now enforced making a practical demonstration impossible.

The pictorial section occupies about as much of the walls as usual, and the greater part of the remaining space is taken up by professional and trade work, and apparatus exhibits, many of which, however, are not entirely devoid of scientific interest. But upstairs, in the gallery that runs round the central hall, there will be found a very excellent collection of "scientific, technical and photomechanical exhibits."

The Royal Observatory, Greenwich, contribute some of their most recent work with the 30-inch reflector, the 26-inch Thompson photographic refractor and other instruments. The photograph of the great nebula in Orion, taken last December, appears to be especially noteworthy. Two plates of the planet Eros are shown. A photograph of ξ Ursæ Majoris, taken with the 28-inch equatorial, the object-glass being corrected for photography by the separation of the lenses and reversal of the crown lens, as proposed by Sir G. G. Stokes, testifies to the value of this method of correction. Examples of work with the occulting shutter and several recent eclipse photographs will be

examined with interest. Among several other astronomical photographs may be mentioned a paper enlargement of very considerable dimensions of the transit of Venus in 1882, by Prof. David P. Todd, and a series of photographs by the Rev. John M. Bacon illustrating his balloon ascent to search for the Leonids last November.

There are several contributions of photomicrographs. As examples of skill in this direction, the series by Mr. E. M. Nelson, of diatoms, exhibited by the Royal Microscopical Society, will probably attract the most attention. The natural history and biological photographs of all kinds are too numerous to refer to in detail. As notable illustrations of the value of a series of photographs illustrating biological changes, the sixteen lantern slides, by Mr. Martin F. Woodward, from his photomicrographs, showing the fertilisation and segmentation of the egg of *Ascaris megaloccephala*, and a frame of photographs, by Mr. Edgar Scamell, showing the different stages in the growth of a nasturtium, will well repay careful study. The photographs in the latter series are so numerous that they would almost serve to illustrate the growth of the plant as a "living picture" by means of a cinematograph. It is very usual to slow down a rapid movement that its details may be recognised, and there is doubtless much to be learnt from the representation in a few seconds of changes that naturally require days or even weeks for their completion.

The applications of photography in many other directions are well illustrated. The automatic recording of the variations of scientific instruments, spectroscopic work, surveying, mining, engineering, the production of metal reliefs, are a few of the subjects that occur to us. Dr. W. J. Russell shows prints to illustrate the photographic activity of the radiations from "the metals radium and polonium," and also from uranium salts, which he finds do not lose any of their activity by keeping them for three years in the dark.

Photography itself, as distinguished from its applications, has received considerable attention, and we would point out that if exhibits of this character could be kept together in future exhibitions, it would much facilitate their study. A print from the enlargement (four thousand diameters), by Dr. Neuhaus, of a section of a film of a Lippmann interference photograph, copies of which have already been seen here, is exhibited by the doctor himself, and shows very clearly that the silver is deposited in layers, as the theory of the process indicates. Several examples of the Lippmann process may be seen in another part of the exhibition. An interesting demonstration of the possible range of exposure is given by the Kodak Company. They show seven negatives exposed under the same conditions, but for periods of from one to fifty, all of which were developed for the same length of time in the same developer. The longer the exposure the denser the negative, but the prints from them are scarcely distinguishable from one another. They show clearly that a small variation in exposure, or even none at all, will serve for very different subjects if negatives of various densities are not objected to.

Mr. Thomas Manly, the inventor of the "Ozotype" process of pigment printing, shows some examples of his method, one of which was exposed and washed thirteen months before the pigment was applied to it, proving that the power of the exposed bichromated paper to render gelatine insoluble and so fix the pigment does not sensibly change by keeping it. The process which in this country has hitherto been associated with Prof. Joly's name is illustrated by the Colour-photo Company of Chicago, and called the "McDonough-Joly process," referring to Mr. McDonough, who worked out the method in America simultaneously with Dr. Joly. They show that there is still room for improvement in the ruling of the triple coloured lines, and also in the nearer approximation of the photographic plate and the coloured screen. By looking at various angles across the ruling, the colour of the different parts of many of the pictures alternate between green, red and blue. This, we take it, is due to the distance between the colour screen and the photographic plate. Mr. Sanger Shepherd shows some striking examples of his triple film three-colour photographs.

The most notable novelty in apparatus is the "panoram kodak," for which the Kodak Company have been awarded a medal. All forms of projection have their advantages and their disadvantages. By adopting the cylindrical or panoramic perspective, many subjects are possible for photography that could not be rendered by the plane perspective given by the ordinary fixed lens and plate. The arrangements necessary for a rotating

lens have invariably been costly and heavy, and the Kodak Company have made quite a new departure in cameras in designing one that is light and cheap, and rapid enough in action to serve as a hand camera. The sample shown is called the "No 1 Panoram Kodak," from which we suppose that larger cameras of the same pattern will be issued in due course. It gives a picture seven inches long with a lens of about three and a half inches focal length. Film is used, and the drawing of it over the curved guides, to bring a new piece into position, is no more difficult than changing the film in any of the other kodaks. It has no shutter as usually understood, but the lens with its cone behind it swings beyond the sensitive surface and past a little flap, so that in its position of rest light cannot pass through the lens to the film. The apparatus is very ingeniously constructed, simple and effective.

There are many other exhibits of technical interest that might be noticed in detail, particularly, perhaps, photographs of living creatures of all kinds; but to enumerate them would be to reproduce a considerable portion of the catalogue. Many are evidence of the great skill and perseverance of the exhibitors. Some fine examples of photogravure show this process at its best. Some photogravures in colour, by Messrs. Ignatz Herbst and Theodore Reichs, show what can be done by a single printing after the various colours have been applied to the plate by the hand of one or more artists.

The exhibition is open daily until November 3.

THE INTERNATIONAL GEOLOGICAL CONGRESS.

THE eighth International Geological Congress was held this year in France. The work of the Congress consisted of papers read at the meetings at Paris, which were followed by discussions, and by excursions into different parts of the country, conducted by French geologists.

The meetings of the Congress took place from August 10-27 at the Palais des Congrès, within the enclosure of the International Exhibition.

The inauguration was held on Friday, August 16, under the presidency of M. Leygues, Minister of Public Instruction and the Fine Arts. M. Karpinsky, president of the last session of the Congress at St. Petersburg, gave an address; he then read the following list of the members of the Committee, proposed by the Council:—Ex-presidents, MM. Capellini and Karpinsky. President, M. Albert Gaudry. General secretary, M. Charles Barrois. Vice-presidents—Germany: MM. H. Credner, Lepsius, Schmeisser, Zirkel, von Zittel. Austria and Hungary: MM. Böckh, Mojsisovics of Mojsvar, Tietze. Belgium: MM. Moulron, Renard. Bulgaria: M. Zlatarski. Canada: Dr. Frank Adams. United States: Messrs. Hague, Osborn, Stevenson. France: MM. Michel-Lévy, Marcel Bertrand. Great Britain: Sir Archibald Geikie, Sir John Evans. India: Dr. Blanford. Italy: MM. Cocchi, Mattiolo. Japan: M. Kochibe. Mexico: M. Aguilera. Norway: Dr. Brøgger. The Netherlands: M. Martin. Portugal: MM. Choffat, Mendés-Guerreiro. Roumania: M. G. Stéfanescu. Russia: MM. Loewinson-Lessing, A. P. Pavlov, Sederholm, Tschernyschew. Sweden: M. Högbom. Switzerland: MM. Baltzer, C. Schmidt. Secretaries: MM. Zimmermann, W. Pavlow, von Arthaber, Gäbert, Crema, Cayeux, Thévenin, Thomas. Treasurer: M. Léon Carez. This list was voted with applause.

M. Albert Gaudry, the new president, then read the inaugural address. In the warmest terms the eminent geologist welcomed the assembly of scientific men who had come from all parts of the world, and then proposed that they should rise to show honour to the memory of the learned geologists who had passed away since the last Congress. The president referred to the principal propositions submitted during the preceding sessions, and enumerated the four sections of the present Congress:—

- I. Section of general and tectonic geology.
- II. Section of stratigraphy and palæontology.
- III. Section of mineralogy and petrography.
- IV. Section of applied geology and hydrology.

M. Charles Barrois, general secretary, read his report on the work of the Committee of Organisation. M. Leygues, Minister of Public Instruction and the Fine Arts, welcomed the foreign members of the Congress in the name of the Government.

Section I. (General and Tectonic Geology). President: Sir Archibald Geikie.

Papers:—Presidential Address on international co-operation in geological investigation; Chamberlin, the assistance of the Congress in the fundamental investigations of geology; J. Joly, the geological age of the earth fixed by the amount of sodium in the sea; on the experiments relative to erosion in fresh water and salt water; order of the formation of silicates in igneous rocks; mechanical structure of marine sedimentation; A. de Lapparent, definition for each of the periods of the history of the globe, of the regions where by preference arguments should be sought on which the precise delimitation of the geological strata and substrata could be founded; Munier-Chalmas, Parisian Tertiary strata, delimitation of the Secondary and Tertiary formations; Stanislas-Meunier, phenomena of subterranean sedimentation; Bleicher, denudation of the Lorraine plateau and its results; Richter, reading of the report of the Commission on Glaciers; H. F. Reid, on the movements of glaciers; Arctowski, remarks relating to the former extent of glaciers in the land regions discovered by the Belgian Antarctic expedition; Popovici-Hatzeg, presentation of the new geological map of Roumania on the scale of 1/300,000; Voræeg, proposition tending to simplify the observation of the inclination and strike of the strata; l'Abbé Parat, geological observations in the caves of La Cure (Morvan).

Section II. (Stratigraphy and Palæontology). President: Dr. von Zittel. Discussion on the report of the International Commission on Stratigraphic Classification.

Papers:—Scott, fauna of Patagonia; Raulin, Tertiary districts of Aquitania; C. Eg Bertrand, charbons gélosiques et charbons humiques; Grand'Eury, formation of coal-seams in the coal basins of Central France; Lemière, transformation of vegetables into fossil fuel; Osborn, progress of the methods of palæontology; relations between the mammal fauna and the Tertiary horizons of Europe and America; E. Fichet, presentation of the third edition of the geological map of Algeria on the scale of 1/800,000; Flamand, on the geology of the south of Algeria and the regions of the Sahara; Douville, on the Jurassic formation of Madagascar; on the results of the exploration of M. de Morgan in Persia; Zeiller, fossil plants of Tonquin; Malaise, the Cambrian and Silurian of Belgium; Dr. P. Ehlert, on the reproduction of fossil types; W. F. Hume, the rift valleys of Sinai; T. Barrow and W. F. Hume, on the geology of the eastern desert of Egypt.

Section III. (Mineralogy and Petrography). President: Dr. Zirkel. Honorary Presidents: MM. Rosenbusch and Fouque.

M. Lacroix announced the views adopted by the International Commission of Petrography in its meetings of October 25 and 26, 1899.

The following proposals were adopted by the Assembly:—

(1) The names of the authors should always be given after the names of the rocks, as is the custom in zoology and botany.

(2) It is proposed to the Congress of 1900 to appoint an International Commission charged to publish the names of all new rocks with their descriptions as concisely as possible, with also their chemical analysis and, if necessary, a drawing representing their structure. This publication is to appear in the volume of the reports of the International Congresses.

(3) It is, above all, desirable to regulate the nomenclature of the eruptive rocks, where the want of unity is particularly felt. Different authors attribute a different sense and signification to one and the same name, while different terms are employed to designate the same rock, the same group of rocks, or the same structure. All the inconveniences of the present nomenclature can, and should be, avoided, at least for the large groups.

(4) The characteristics of the large groups, for example, of the families should be founded on the mineralogical composition, supported by the chemical composition and the structure.

(5) The large groups ought to be fixed from the present without disturbing the subsequent development of the classification, and the separation of these groups into subdivisions.

(6) It is desirable to designate the principal types of structure by special names.

(7) It is necessary to avoid the employment of the same term in different senses.

(8) One should avoid as much as possible the employment and introduction of different terms to designate the same notion, the same rock, or the same group of rocks.

(9) It is necessary to avoid as much as possible for new types of rocks the employment of pre-existing names, and assigning to them a new sense, or restricting or enlarging their meaning.